REMARKS

Claims 3-6 and 8-29 are pending in this application.

Claims 3-6 and 8-29 are rejected.

The office action dated August 24, 2004 indicates that independent claims 8-9, 5-6 and 12-29 are rejected under 35 U.S.C. §102(b) as being anticipated by Wober U.S. Patent No. 5,475,769; claims 3-4 are rejected under 35 U.S.C. §103(a) as being unpatentable over Wober in view of Bell U.S. Patent No. 5,170,202; and claims 10-11 are rejected under 35 U.S.C. §103(a) as being unpatentable over Wober in view of Acharya U.S. Patent No. 6,348,929. The office action also raises objections to claims 3-4 and 24-25.

Rejections of claims 18-20 and 26-29

The rejection of independent claim 18 has been rendered moot by the amendment above. Amended claim 18 recites a method of generating a linear operator for demosaicing of a digital image by a digital camera. The method comprises accessing a parametric image capture description; measuring parameters of the camera; and using the parametric description and the measured parameters to obtain coefficients of the linear operator.

Wober et al. compute optimal coefficients using a known test pattern. The test pattern is captured by a digital camera, which provides a mosaic image. Then an optimum set of coefficients is calculated by minimizing the squared difference between the image of the known test pattern and a third image (the third image is obtained by linearly demosaicing the mosaic image with that set of coefficients).

Wober et al.'s linear demosaicing approach is summarized at col. 2, lines 25-35 and in particular by the equation at line 26. The equation at line 26 is A*W=X, where A is a matrix of neighborhood values acquired by a camera, X is a vector representing a single pixel, and W is a matrix that contains weighting coefficients. . Thus, the equation at line 26 computes a single value (X) in the third image. The location of the pixel (X) in the third image corresponds to the central pixel of the neighborhood (matrix A). The matrix W is slid across the image of the known test pattern to compute additional pixels of the third image.

Wober et al. solve for the coefficients in matrix W using linear minimum mean square error (LMMSE) between the image of the known test pattern and the linear demosaicing of its corresponding mosaic image (i.e., the third image). The matrix W is applied to each of the pixels in the image of the known test pattern, and a set of coefficients for matrix W is computed that is best in an LMMSE sense) for all of the pixels.

Thus, Wober et al. offer an example/training-based approach, where matrix W is trained using the known test pattern as an example. Wober et al. do not assume to know anything about the forward process of how a camera captures an image. No information about the image capture process or the camera is used. The camera and the image capture process are treated as a black box.

Contrast this to the method recited in claim 18, which uses information about the image capture process and the camera. The information includes a parametric image capture description and measured camera parameters.

Claim 27 has been amended to recite the type of camera information that

can be measured. New claims 30-32 recite features of the parametric image capture description.

Claim 33 has been added to recite that the linear operator is obtained without using measured samples of an image. Contrast this to Wober et al., which use samples in the matrix A.

Claims 34-35 recites features of how the linear operator is obtained. In both claims, inversion of the parametric image capture description is performed. Contrast this to Wober et al., which does not perform inversion of such a description to obtain the matrix W.

Claims 36-37 have also been added to the application. These new claims depend from claim 18.

Claim 28 has been cancelled. Claim 29 has been amended to depend properly from claim 18.

None of the other documents made of record teach or suggest that Wober et al.'s method can be modified to produce the method of amended claim 18. Therefore, amended claim 18 and its dependent claims 19-20, 26-27 and 29-33 should be allowed over the documents made of record.

Rejections of claims 3-6, 8-17 and 21-25

Amended claim 8 recites a method of processing an input digital image produced by an optical system, the input image having less than full color information at each of a plurality of pixels. The method comprises accessing an operator including an array of demosaicing weights, values of the weights determined from measured parameters of the optical system and a model of the optical system; and applying the operator to the input image to produce an output image having full color information at each of a plurality of pixels.

Thus, amended claim 8 recites a model-based approach. This approach uses statistical inference (e.g., a probability distribution) that addresses different possible images in a device-independent way.

Wober et al. do not teach or suggest a model-based approach for determining the linear operator. As discussed above, Wober et al. treat a camera as a black box and use an example/test-based approach to determine the coefficients of matrix W. The only measurements used by Wober et al. are measurements of the image of the test pattern.

On page 3, the office action states that the equation at col. 2, lines 25-35 is a camera model "since it is used to solve for weighting coefficients (W) in an idealization or conception for such the camera." This statement is not accurate. Wober et al. use an example/training technique to solve for the weighting coefficients. The example/training technique relies upon the image of the known test pattern and an image obtained by linearly demosaicing the image of the known test pattern with the matrix W. Wober et al. do not teach or suggest the use of statistical inferences or any other description of how a camera captures an

image.

Amended claim 8 and its dependent claims 9-17 and 21-23 should be allowed over the documents made of record. Claims 3-6, 12-14 and 24-25 have been cancelled.

Objections to claims 3-4 and 24-25 have been rendered moot by the cancellation of these claims.

The total number of independent claims stands at two and the total number of claims has been reduced from 26 to 24. Although eight claims were added to the application, nine claims were cancelled.

The examiner is respectfully requested to withdraw the rejections of the claims and issue a notice of allowability. The examiner is invited to contact the undersigned to discuss any remaining issues.